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Botanical Notes in the Great Valley of Virginia and in the Southern Alleghanies.

BY E. G. BRITTON.

(Read March 9.)

These regions have been quite thoroughly explored by botanists, and I can hope to add little that is new to the published accounts* of their flora, but as a record of an autumn trip into a most delightful country this may not prove uninteresting.

The great Appalachian Valley extends almost uninterruptedly from Lake Champlain southwestwardly to its termination at Lookout Mountain in Georgia. It is excavated from Lower Silurian rocks, mainly limestones and slates. Having travelled southward from Harrisburgh, Penn., to Luray in central Virginia, it was here in Page Valley, as the Appalachian depression is there locally known, that our botanizing began. The underlying rock is mostly limestone, bounded, however, to the east by quartzite, and from these different rocks result two soils differing radically in their flora. On the silicious soils were noticed many plants which grow abundantly on the sands of southern New Jersey; among these were: *Stylosanthes elatior*, Swartz; *Euphorbia corollata*, L.; *Ascyrum Crux-Andreæ*, L.; *Cuphea viscosissima*, Jacq.; *Tephrosia Virginiana*, Pers.; *Chrysopsis Mariana*, Nutt.; *Gnaphalium purpureum*, L., *Quercus nigra*, L., and *Q. stellata*, Willd., the latter larger than we had seen before. On limestone knobs *Cercis Canadensis*, L., grew abundantly, and on the bank of the Hawksbill Creek we found *Sedum telephiodes*, Michx. Its petals were white, but the general effect of the plant was pink, owing to the redness of the pedicels and stamens. The leaves and stems were covered with a beautiful glaucous bloom. In order to preserve these lovely specimens they were ironed until flat and thin between sheets of newspaper, and then allowed to dry in an oven. Herbarium specimens were thus obtained which have not since lost their leaves.

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* See Dr. Gray's account in a letter addressed to Dr. Hooker, published in the Am. Journ. Sci. (I), xlii., pp. 1–49; and Mr. Redfield's paper in the BULLETIN, vi., pp. 331–339.

The banks of the Hawksbill were blue with *Eupatorium cœlestinum*, L. Among introduced plants along the roadsides grew *Xanthium spinosum*, L., and *Filago Germanica*, L.; and everywhere growing as weeds, were seen *Solanum Carolinense*, L., with white and blue flowers, and *Sida spinosa*, L. The most abundant Conifer was *Pinus mitis*, Michx., on whose leaves the stomata were conspicuous with a pocket lens, arranged in longitudinal rows on both sides. *Pinus inops*, Aiton, is very abundant elsewhere in the valley, but was not noted at Luray. The only form of vegetation seen in the famous caverns was the mycelium of a fungus growing on wet planks.

The list of plants noted at the Natural Bridge of Virginia is much too long for insertion here, but the following warrant mention: In the deep ravine of Cedar Creek, which is spanned by the Bridge, grew *Heuchera villosa*, Michx.; *Draba ramosissima*, Desv.; *Samolus Valerandi*, L., var. *Americanus*, Gray; *Sedum ternatum*, Michx.; *Rhus aromatica*, Ait.; *Jeffersonia diphylla*, Pers.; *Hydrophyllum Canadense*, L., and *H. Virginicum*, L.; *Asarum Virginicum*, L.; *Aralia quinquefolia*, Gray; *Hydrangea arborescens*, L.; *Ruellia strepens*, L; *Elephantopus Carolinianus*, Willd.; *Asimina triloba*, Dunal; *Pellæa atropurpurea*, Link; *Asplenium Ruta-muraria*, L.; *Cystopteris bulbifera*, Bern.; and *Camptosorus rhizophyllos*, Link. On the hillsides were found *Houstonia purpurea*, L., var. *longifolia*, Gray; *Calamintha Nepeta*, Link; *Asclepias verticillata*, L.; *Polygala ambigua*, Nutt.; *Linum sulcatum*, Riddell, with showy yellow flowers—which dropped off when touched—and *Salvia lyrata*, L. The large trees of Arbor Vitae along the walk leading under the Bridge were remarkably fine; one of them measured fourteen and one-half feet in circumference.

At Balcony Falls, where the James river cuts through the Blue Ridge, we collected *Campanula divaricata*, Michx.; *Dicentra eximia*, DC., in full bloom on September 5. *Coreopsis senifolia*, Michx., and *C. verticillata*, L., were showy along the railroad track. *Paronychia argyrocoma*, Nutt., and *Hypericum prolificum*, L., grew on the rocks above.

Near Roanoke, Va., were found *Cyperus Lancastriensis*, Porter, and *Ipomœa lacunosa*, L., growing as weeds in a cornfield.

Unless I could show you some of the large photographs taken for the Philadelphia owners of the Eastern Tennessee and Western North Carolina Railroad, you could not begin to realize what a lovely ravine it is through which the Doe River makes its way out from among the mountains to join the Holston. Unfortunately the focusing plate of our camera was found to be broken after the train had left us in the wildest and prettiest part of the gorge, on a stone embankment that sloped 50 or 60 feet down to the rocky stream below. Above us towered the lofty walls of Pardee's Point, on whose steep escarpments scarcely a tree could cling. Here, if anywhere, in this shady, narrow ravine, must the ferns and mosses grow. But, as usual, it was the other side that looked most promising; there, was the natural bank of the river wooded to its edge, here, were the piles of debris thrown down in the construction of the roadbed from the rocky slope, with logs and stumps of trees, and the usual weedy looking, rank growth of saplings and other plants which follow man's devastating efforts at penetrating nature's wilds. To be sure, she had covered up many of the logs and stumps with the tender, pink-flowered vines of *Adlumia cirrhosa*, Raf., and nestled in their shade beautiful clumps of *Dicentra eximia*, DC.; both of these were still in bloom on September 12, and on the shelf-like ledges above us were still seen *Campanula divaricata*, Michx., and *Corydalis glauca*, Pursh, in flower. A few mosses and hepatics were gathered from these dripping shelves, and two little ferns, *Cystopteris fragilis*, Bernh., and *Aspidium marginale*, Swartz. A belated cluster of flowers was picked from a clump of *Hydrangea arborescens*, L., and *Aralia spinosa*, L., was seen in full bloom. It is a handsome bush and forms as pretty clumps as our sumachs. *Carex stenolepis*, Torrey, was found near the edge of the stream.

But this Doe River gorge is only the gateway, for Roan Mountain lies beyond, and we must climb all day in a tossing, bone-aching stage-coach ere we reach "Cloudland." Frequent walks and stops on the way up enabled us to botanize quite satisfactorily, and thus we made several new acquaintances. The first and most charming of these was *Chelone Lyoni*, Pursh, with its lovely pink blossoms; we saw the greatest abundance of *Cimicifuga racemosa*, Ell., and luxuriant plants of *Solidago cæsia*, L., followed higher up by an abundant growth of *Eupatorium ageratoides*, L. Both of these were in full bloom, and stretched away under the trees a graceful white carpeting to the giants that towered above them. Never had I seen such forests, even on the slopes of the Green and White Mountains; Chestnuts, Oaks, Beeches, Birches, Maples and Tulip Trees, attaining such size that it was not uncommon to find logs whose diameter was nearly five feet. *Magnolia Fraseri*, Walt., grew abundantly with these, and toward the summit *Ilex monticola*, Gray, was frequently seen 15 to 20 feet high, and *Cratægus tomentosa*, L., var. *punctata*, Gray. Just before reaching the zone of *Abies Fraseri*, Pursh, which here replaces *Abies balsamea*, Marsh., and *A. nigra*, Poir., of our northern mountains, we found the ground carpeted with *Houstonia serpyllifolia*, Michx.; and here also grew showy plants of *Gentiana quinqueflora*, Lam. belieing its name, for I counted over one hundred flowers on a single plant. *Rudbeckia laciniata*, L., and *R. triloba*, var. *rupestris*, Gray, were showy and abundant. Among the firs we found *Saxifraga leucanthemifolia* and *Heuchera villosa*, Michx., very abundant in damp, rocky places, and contrasting their delicate white flowers with the dark trees around them.

Three delightful days were spent on the summit, in a large hotel constructed of balsam cut right there on the mountain, and occupied mainly by hay-fever patients. The top is a great mountain meadow, in parts densely cushioned with beds of the fine soft grass, *Danthonia compressa*, Austin, and much *Carex æstivalis*, Curtis. We walked a great deal, exploring the various outlook points and ledges, collecting the rare *Sedum Rhodiola*, DC., and *Thalictrum clavatum*, DC., from Eagle Cliffs, finding late blossoms of the pretty little bluet *Houstonia serpyllifolia*, Michx., and the dark purple ones of *H. purpurea*, L., hidden in shady nooks; gathering the lovely red berries of *Vaccinium erythrocarpon*, Michx., and the flowers of *Leiophyllum buxifolium*, Ell., var. *prostratum*, Gray, which were surprisingly numerous, considering it was the second bloom. I found a number of blossoms in which all the petals were replaced by stamens; the plants carpeted the ground, covering the stones and spreading everywhere on the summit, with *Menziesia ferruginea*, Smith, var. *globularis*, Gray, and *Potentilla tridentata*, Ait. *Alnus viridis*, DC., and *Rhododendron Catawbiense*, Michx., formed beautiful clumps, like prettily planted groups on a lawn, and grow in immense quantities. In fact I was disappointed because there were so many of these last four plants and so few others. By careful search among the bushes on the south slope of the mountain we found *Trautvetteria palmata*, F. and M., in fruit; fine plants of *Angelica Curtissii*, Buckley, *Viola canina*, L., var. *sylvestris*, Regel, and *V. blanda*, Willd.; *Prenanthes altissima*, L, and *P. serpentaria*, Pursh., var. *barbata*, Gray; *Lobelia syphilitica*, L., and *Chelone glabra*, L.; *Solidago spithamea*, *S. patula*, *S. bicolor*, and quantities of the cut stems and leaves of *Veratrum viride*, Ait., which we learned had been dug by the natives for the medicinal roots, which bring four or five cents a pound. The prettiest of all the mountain flowers at this season was the *Geum radiatum*, Michx., with its golden yellow flowers, growing most abundantly on the northern slope; and here too we found *Geum geniculatum*, Michx.; *Aspidium spinulosum*, Swartz, var. *dilatatum*, Gray; *Lycopodium Selago*, L.; *Maianthemum Canadense*, Desv., and *Circœa alpina*, L. Among the *Danthonia* on the summit we noticed *Juncus articulatus*, L., *Aira flexuosa*, *Agrostis rupestris* quite abundant. We walked down the mountain, preferring this to jolting down in the stage. Just as we started down we noted the Mountain Ash twenty feet high, in beautiful fruit, with *Cornus alternifolia*, L., and an abundance of *Viburnum lantanoides*, its leaves already turned in their peculiar mottled way. Along the path followed by the mail carriers, where the thickets of *Rhododendron maximum*, Michx., had been burned through, we saw *Plantago Rugelii*, *Gnaphalium purpureum*, L.; *Marchantia polymorpha*, L., and the moss *Funaria hygrometrica*, Sibth., which the French call "La Charbonniere." Ferns were numerous and the following were noted: *Dicksonia pilosiuscula*, Willd.; *Adiantum pedatum*, L.; *Asplenium thelypteroides*, Michx.; *Aspidium acrostichoides*, Sw., var. *incisum*, Gray, and *A. spinulosum*, Sw., var. *intermedium*, Gray; *A. Noveboracense*, Sw., and two plants of

A. Goldieanum, Hook.; this extends the southward range of the last named species, as given by Gray, Eaton and Davenport; *Phegopteris hexagonoptera*, Fee, and *Botrychium Virginianum*, Sw. We found *Galium latifolium*, Michx., and *G. lanceolatum*, Torrey; *Galax aphylla*, L.; *Pyrularia oleifera*, Gray; *Oxydendrum arboreum*, DC., and fasciated flowers of *Helenium autumnale*, L.; *Lobelia cardinalis*, L. Two different forms of *Astilbe decandra*, Don., were obtained along the trail; one, the type of the species, with acuminate apices to the leaf-lobes, the other with blunt and crenate margins to the leaves, and shorter, smaller follicles. This latter is a new form to Dr. Gray and Mr. Watson. In rivulets half-way up grew *Saxifraga erosa*, Pursh., and *Diphylleia cymosa*, Michx., the latter very conspicuous because of its scarlet pedicels and blue-black fruit.

To make this eventful week complete we went to the terminus of the railroad at Cranberry, where one of the most valuable iron mines of the country is located. It could hardly have been expected to find such delightful accommodations as we here enjoyed, in a hotel under the charge of Philadelphia people and luxurious in its appointments and neatness, situated in a wild and beautiful valley. A peculiary hoary *Verbena*, fine specimens of *Spiranthes graminea*, Lindl., var. *Walteri*, Gray, and *Solidago patula*, Muhl., were found here.

Returning from Cranberry to the Great Valley again at Johnson City, we went by rail to Morristown, Tenn. From there a delightful ride along the valley of the French Broad, brought us at evening to Asheville, N. C. Along the river banks we saw for the first time since leaving the North the Buttonball, Sweet Gum, Ash-leaved Maple (*Negundo aceroides*), recognized *Halesias* growing quite abundantly, and noticed in the meadows the coarse *Arundinaria monosperma*, Vahl., with glossy cane-stalks. Asheville is a southern Bethlehem; standing on an elevated plain among low hills with the mountains encircling it in the distance, and the Swannanoa and French Broad Rivers at its feet; it affords delightful drives and boasts a breezy, sunny location. Along the Swannanoa grow magnificent oaks, *Q. falcata*, Michx., and *Q. imbricaria*, Michx.; here *Leucothoë Catesbæi*, Gray, grew in profusion, and we admired its glossy foliage and abundant fruit. A single specimen of *Aconitum uncinatum*, L., was found on a high bank, and *Ipomœa coccinea*, L., with *Chrysopsis graminifolia*, Nutt, grew wild in cultivated grounds.

But Asheville is too civilized, and walking was far from agreeable in that dusty, hilly region, so we took the afternoon train on the W. N. C. R. R., reaching Black Mountain Station in the evening. Here, indeed, all else save the hotel is wild and beautiful. In the valley on the eastern side of the railroad there is a mica mine, to which we walked the morning after our arrival, botanizing as we went. The woods were sandy and dry, and autumn was suggested by the tint of the Sorrel Tree and the brown nuts of the Chinquapins. *Gerardias* were in bloom. *G. purpurea*, L., and *G. Skinneriana*, Wood, and *Solidago Boottii*, Hook, were collected. *Helianthus occidentalis*, var. *Dowellianus*, T. and G., and *Coreopsis senifolia*, Michx., added to the list of yellow blossoms. The prostrate plants of *Lespedeza striata*, Hook. and Arn., carpeted the ground along the roadsides; and *Cuscuta compacta*, Juss., climbed up the Blueberry bushes; *Cacalia atriplicifolia*, L., and *Polygala fastigiata*, Nutt., were in bloom in the meadows.

It was as a special treat that we had decided at the last to ascend Mt. Mitchell, for having thoroughly explored the Roan we had little expectation of adding much to our collections, only we should have come away dissatisfied had we failed to climb this, the highest mountain east of the Rockies. Unlike the Roan, however, it has no carriage road up it, so that the ascent has to be made on horseback, and instead of a big hotel full of people, on the summit there is only the rock-encircled grave of Elisha Mitchell. Like the Roan, its base is wooded and heavily timbered with magnificent forest trees and a dense undergrowth of Rhododendron and Laurel along the streams. These were numerous, and we crossed and recrossed them many times in our winding ascent. I longed to visit these wilds in spring to see the flame-colored Azalea in bloom, whose fruit-laden branches hung over our path. Of low plants there were few in bloom in the shady woods. *Diphylleia cymosa*, Michx., grew in hollows of the streams, and *Amianthium muscætoxicum*, Gray, and *Aster Curtisii*, T. & G., along the path. Among the ruins of the half-way house, *Cratægus punctata* was again noted bearing many branching thorns, and *Hypericum prolificum* was gathered in fruit. Here begins the coniferous vegetation of White Spruce and Balsam; the ground and rocks were densely covered with mosses and ferns similar almost in every respect to the same zone in the White Mountains, save for an occasional bush of *Vaccinium erythrocarpon* and *Menziesia,* or a hollow with *Rhododendron Catawbiense.* The fruit of *Lilium Grayi,* Watson, was found at one of the clearings, and *Angelica Curtisii,* Buckl., abundantly with *Monarda didyma,* L. As we drew near the summit the black, angular fruit of *Trillium grandiflorum,* Salisb., became quite frequent, and at the place where we left our horses for the last scramble up to the top, we found a few late showy blossoms of *Hypericum graveolens,* Buckley. *Cuscuta rostrata,* Shuttlew., twined over anything and everything, and its waxy white blossoms were the prettiest flowers gathered that day, and the only offering I had to lay on Mitchell's grave. Around it is a space of forty or more feet, bare but for a low stunted form of *Trifolium repens* with its blossoms close to the ground, and the tiny panicles of *Poa annua* in crevices among the rocks.

An hour's rest, lunch, and a fairly good view, and then began the descent. Walking was more comfortable than riding for the greater part of the distance, as the horses picked their way down the rocks less readily than we, so that it was nine o'clock and quite dark ere we reached Mt. Mitchell Hotel, tired out after so long a day and so hard a ride—twenty-six miles in all. A Sunday morning spent in resting and letter-writing and then we turned our faces homeward. As we wound down the mountains through the wonderfully beautiful Swannanoa Gap, it was with the keenest regret that we bade farewell to these fascinating regions. The railroad is a marvel of engineering skill; in the short space of five miles there are seventeen tunnels, one long one curving around a point, and others following in such rapid succession that three might be seen in line from the rear platform, and at the last, just before we reached Round Knob, the train creaked over three long white trestles, one above the other over the same stream, with a curve between each, and slowed up at the hotel for supper.